Claims

1. Wireless audio signal transmission method for audio signals between a transmitting device (S40) and a spatially adjacent receiving device (E50) which is associated with an audio signal reproduction device (LB) included in a three-dimensional sound system, this method comprising the following features:

- before transmission, the audio signals are digitized in a transmitting device (S40), compressed, and transmitted by a digital high-frequency transmission method as data packets (FD), wherein symbols are assigned to the individual data in a quadrature signal plane;
- a transmitter diversity operation takes place between the transmitting device (S40) and the receiving device (E50), wherein the transmitting device has two high-frequency transmitters (S5, S6) with associated transmission antennas (AS1, AS2), which transmitters are separate but operate in the same frequency band (f), whereas the audio signal reproduction device (LB) has only a single receiving device (E50) with one receiving antenna (EA) and one high-frequency receiver (E5) for the frequency band (f); and
- the two data streams for the transmitter diversity operation are derived by a predetermined coding instruction from the previously digitized audio data stream.

2. Audio signal transmission method according to Claim 1, characterized in that

- in the transmitting device (S40) the data sequence (D_o) is converted before transmission into a first and second data sequence (D_1, D_2) of successive symbol pairs (Sy1, Sy2), wherein in the first and second data sequence (D_1, D_2) the symbol pairs related in time contain the same symbols (A, B or C, D);
- in the first and second data sequence (D_1, D_2), the order of the symbols (A, B or C, D) within the symbol pairs (Sy1, Sy2) is transposed relative to each other in the time sequence; and
- in addition to the time transposition, a change in their coding in regard to the quadrature signal components is implemented, wherein the change relates to the sign

of the particular symbol and/or to a transformation of the particular symbol to its complex conjugate value.

3. Audio signal transmission method according to Claim 1, characterized in that the data volume of the digitized audio signals is reduced by a compression method in the transmitting device (S40), then reversed in the receiving device (E50) by an associated decompression method.

4. Audio signal transmission method according to Claim 1, characterized in that the data packets (FD) contain header information (H) including control and auxiliary information.

5. Audio signal transmission method according to Claim 1, characterized in that the data component of each data packet (FD) contains audio data for two audio signal reproduction devices (LB).

6. Audio signal transmission method according to Claim 5, characterized in that each data packet (FD) contains an even number of data blocks by which the data of a first and second audio channel (L, R) are alternately transmitted in blocks.

7. Transmitting device (S40) for use in a wireless audio signal transmission method according to one of Claims 1 through 6 between the transmitting device (S40) and a spatially adjacent receiving device (E50) which is associated with an audio signal reproduction device (LB) included in a three-dimensional sound system,

characterized in that

- the transmitting device (S40) contains two high-frequency transmitters (S5, S6) to which digitized audio signals and control signals are supplied as data packets from a coding device (CS);
- the two high-frequency transmitters (S5, S6) generate quadrature signals in the same frequency band (f) which are modulated with the data of the data packets (FD); and

- the two high-frequency transmitters (S5, S6) are each equipped with an antenna (AS1, AS2) for transmitter diversity operation.

8. Transmitting device (S40) according to Claim 7, characterized in that the coding device (SC) generates a first and second data sequence (D_1, D_2) from an original data sequence (D_o) which are converted in a high-frequency stage by two quadrature mixers (M1, M2) to the same high-frequency band (f), are then supplied to the first or second antenna (AS1, AS2) to be transmitted.

9. Transmitting device (S40) according to Claim 8, characterized in that the coding device (SC) implements coding based on the space-time block code.

10. Receiving device (E50) for use in a wireless audio signal transmission method according to Claims 1 through 8 between a transmitting device (S40) and the spatially adjacent receiving device (E50) which is associated with an audio signal reproduction device (LB) included in a three-dimensional sound system;

<u>characterized in that</u>

- the receiving device (E50) contains a single high-frequency receiving stage (E5) to receive high-frequency signals transmitted by the transmitter diversity method, which stage converts the high-frequency signals to a significantly lower frequency position, wherein the transmitter diversity has two different signals which are transmitted by two antennas (AS1, AS2) but in the same frequency band (f); and

- an analog-to-digital converter (ADE) connects to the high-frequency receiving stage (E5), the converter being followed by a digital decoding device (CE) which decodes the transmitted symbols (A, B, C, D) from the signals in the low frequency position.

11. Receiving device (E50) according to Claim 10, characterized in that the decoding device (CE) implements decoding based on the space-time block code, and contains the following functional units in the direction of the signal flow: an electronic switch (Sw1) which supplies the digitized receive signal to a first and second terminal (1, 2) of a linear combination (h^{-1}) at the clock period of the symbol rate (t_s); a symbol decision element (ET) connected to the two outputs of the linear combination (h^{-1}), to which

decision element a symbol table (TB) is connected which supplies the logical level of the associated symbols at the two parallel outputs; and finally, another electronic switch (Sw2) which regenerates the original data sequence (D_o) from the parallel available symbols by alternate switching at the symbol clock period (t_s).